SAVANNAH RIVER SITE

321-M Fuel Fabrication Facility

Technology Post-Demonstration Fact Sheet
August 27, 1999

STRIPPABLE COATINGS FOR DECONTAMINATION

Figure 1. Spray application of strippable coatings.

Need Description

Residual contamination is often non-adherent, and can lead to an airborne activity problem. For D&D projects, there is no guaranteed ability to process liquid waste. There is a consequent need for a technology to remove surface contamination without producing liquid secondary waste.

Innovative Technology Description

The *ALARA™ 1146 Cavity Decon* is a strippable coating technology used for the decontamination and immobilization of surface contamination. It is a vinyl based coating approved for the decontamination of reactor cavities during reactor outages. Applied by spraying, brushing, or rolling, the coating migrates into micro-voids of surfaces to contact contaminants.

During a 24-hour curing, the coating mechanically locks the contaminants into a polymer matrix. After curing the coating is easily peeled or stripped from the surfaces and produces a solid waste that is compactible and incinerable. The *ALARA™ 1146 Cavity Decon* is non-toxic and does not contain volatile compounds or heavy metals.

The *ALARA™ 1146 Cavity Decon* strippable coating also provides a durable coating that can be used to immobilize surface contamination or protect surfaces from contamination during D&D operations.

Baseline

The baseline technology is the Kelly Decontamination System. The Kelly system uses superheated water as a decontamination agent. The system can be used with either a spray wand or a vacuum shrouded spray head suitable for floors, walls, ceilings, and other flat surfaces. The vacuum shrouded head recovers the liquid and contaminants and passes them through a liquid separator. A demister, and high efficiency particulate air (HEPA) filter removes contaminants and discharges clean air to the environment. The separated solid and liquid are secondary waste streams.

Demonstration Summary

As the final phase of an investigation of strippable coatings conducted by Florida International University's Hemispheric Center for Environmental Technology, six commercially available strippable coatings were assessed at the 321-M Fuel Fabrication Facility. The coatings were applied side-by-side to the same type of surfaces under similar radiological conditions. Data on application, appearance, removal, decontamination factors, waste, and durability was collected to evaluate the overall performance of each coating. As a result of the assessment, the *ALARA™ 1146 Cavity Decon* strippable coating was selected for a demonstration.

Approximately 2845 sq ft of wall and floor area were coated with the *ALARA™ 1146 Cavity Decon* in the Machining Room, Log Storage Room and the Casting Room Cooling Hut of Building 321-M.

The surfaces were painted and unpainted carbon steel and painted concrete. For the surfaces that had the highest contamination levels, Decontamination Factors (DF) up to 7.2 (alpha) and up to 3.9 (beta/gamma) were achieved. The DF was lower for less contaminated surfaces, as would be expected.

Preliminary analysis indicates that the DF's, productivity rates, and costs of the *ALARA™ 1146 Cavity Decon* are comparable to the Kelly Decontamination System but the strippable coating does not generate a secondary liquid waste.

Seventy gallons of coating were applied during the demonstration. Actual coverage of the coating was approximately 40 ft^2/gal. Application rate was approximately 0.3 gal/min.

Figure 2. Removal of strippable coating.

Figure 3. Coating on Furnace Enclosure for Contamination Control.

The inside surfaces of the casting furnace enclosures were coated with the *ALARA™ 1146 Cavity Decon* as a fixative to reduce potential of airborne contamination. Portions of walls and floors were also covered to reduce the spread of contamination during future work activities. The coatings in these areas were not stripped, but left in place.

A comprehensive assessment of the *ALARA™ 1146 Cavity Decon* strippable coating, as demonstrated at the 321-M facility, is provided in the Innovative Technology Summary Report (ITSR). The ITSR is expected to be available in early FY00.

Benefits of Strippable Coatings

- Eliminates liquid waste
- Reduces solid waste – dried coating can be incinerated
- Immobilizes surface contamination
- Adheres to and easily removable from complex surfaces and components
- Rapid application and removal

Future Applicability

The *ALARA™ 1146 Cavity Decon* will be used for decontamination and immobilization of contaminants in the contamination area of 321-M. The FDD central decon facility is using the *ALARA™ 1146 Cavity Decon* strippable coating for decontamination and contaminant control in their decon cells.

Contacts:

For more information on strippable coatings, visit HCET's website at http://www.hcet.fiu.edu/pdf/hcet98_cd/y7strip.pdf
For more information on the LSDDP and this demonstration, visit the SRS website at http://www.srs.gov/general/srtech/lstd/index.htm

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